

Pray for the souls, divers *Orate pro animabus (sic)* in the windows, and a bell *Ora pro anima Sancta Katharina.* The 'pictures in stone' were doubtless the alabaster images of the reredos, fragments of which are still preserved in the church, exquisite in modelling and colour."

Thus was the beauty of rural England destroyed by a fanatic and at a carefully calculated price.

The second quotation deals with national history and tells us that:—

"Near Hardwick is Childerley Hall, now a farmhouse, and hither King Charles the First was brought by his captors, when carried off by Cornet Joyce from Holmby House, in Northamptonshire. He was not altogether an unwilling captive, for both he and the Army hoped to arrive at some mutual accommodation which would make both independent of that Parliamentary control of which both were heartily wearied. He was treated accordingly with the utmost respect, and during his stay at Childerley Hall (from Saturday, June 5, to Tuesday, June 8), the students of Cambridge 'flocked apace' to pay their homage to him. 'He is exceedingly cheerful,' writes a contemporary scribe, 'shows himself to all, and commands that no scholler be debarred from kissing his hand, for which honour they return humble thanks and *Vivat Rex*; and there the Sophs are in their gowns and caps as if no further than Barnwell.' Nay, even the great chiefs of the army, the men who at Marston and Naseby had faced and conquered him, Fairfax, Ireton, and Whalley, and Cromwell himself, came hither to join in this hand-kissing."

The book is by no means free from small, but to a resident stimulating, errors (like the minute gas-bubbles in soda-water), but in spite of these it will do much to popularise a countryside which has been too long neglected.

#### THE SUGAR CANE AND CANE SUGAR.

*Cane Sugar: a Text-book on the Agriculture of the Sugar Cane, the Manufacture of Cane Sugar, and the Analysis of Sugar House Products; together with a Chapter on the Fermentation of Molasses.* By Noël Deerr. Pp. xv+592. (Altrincham, Manchester: N. Rodger, 1911.) Price 20s. net.

In this work the author has brought together very nearly all the information, both scientific and practical, which an enthusiastic planter, manager, or chemist would be likely to require in dealing with the production of cane sugar.

The first ten chapters—about one-third of the whole space—are devoted to description of the cane and its methods of culture. They include a section on the pests and diseases to which the plant is subject, with notes on the various devices which have been found most useful in combating them. In case anyone should question whether it was advisable for the author, a chemist, to devote a considerable amount of space to the botany, agriculture, and pathology of the sugar cane, as well as to its chemistry, an explanation is offered which enlists our sympathy at once. "I found it impossible," the author says, "to live on plantations without taking a keen interest in . . . all phases of the production of cane sugar."

We may hope that there are many others afflicted with the same kind of inquisitiveness. If so, Mr. Deerr's suggestion that his work may serve to fill a

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gap in English technical literature will no doubt be justified. On plants and insects he may not write with the authority of the professional botanist or entomologist; but that is not the whole story. To point out the road, one need not have helped to make it. A useful purpose is served in stimulating the reader's interest, and putting him in the way of getting further information when his curiosity is aroused. From this point of view the outlines given of the botany of the sugar cane, and especially the summary of the insect and fungoid pests that infest it, are by no means lost labour.

The factory operations connected with the production of sugar and molasses from the harvested cane are dealt with in the next ten chapters, and the remainder of the volume is chiefly concerned with the chemical control of the manufacture and with questions of sugar analysis. There is also a chapter on fermentation and distillation, with special reference to the requirements of the sugar house in respect of the production of rum.

Several years ago V. H. and L. Y. Veley ascribed the phenomenon of "faulty" rum to a micro-organism which they isolated and studied, but their conclusions were subsequently challenged by Scard and Harrison. The author has found in weak rum a fungus which, he says, is "similar" to that described by the Veleys. He does not, however, think it can be called the cause of faulty rum, inasmuch as it did not develop when placed in strong alcohol (75 per cent.). It was not killed, but no change could be traced in sound, clear rum when this was inoculated with a drop of the weak spirit containing the fungus. Apart from the question of micro-organisms as a cause, the turbidity shown by faulty rum on dilution is attributed to the presence of certain kinds of caramel, higher fatty acids, and terpenes.

The book represents a great amount of reading. It is not the author's first work on the subject, and his experience as chemist, manager, and sugar technologist is a guarantee that his own statements are likely to be practical and trustworthy, whilst for the views of authorities quoted copious references are given. Tested here and there on points within the present writer's knowledge, the information has proved to be accurate. The illustrations, which are numerous, include some excellent photographs and coloured plates.

C. S.

#### LABORATORY METHODS IN ZOOLOGY.

*Zoologisches Praktikum.* By Prof. A. Schuberg. Band i., Einführung in die Technik des zoologischen Laboratoriums. Pp. xii+478. (Leipzig: W. Engelmann, 1910.) Price 11 marks.

DR. SCHUBERG has set out to write a laboratory manual of methods for dealing with different groups of animals, but found that there was a good deal of general descriptive matter as to methods, apparatus, and reagents to be dealt with before the systematic treatment of the groups could be reached. It is this general part that occupies the whole of the

present volume. A good deal of it resembles an instrument dealer's catalogue, and almost every piece of apparatus used for zoological technique is described and figured. Then the choice of instruments and their use and abuse are considered, with many experienced remarks. The routine of zoological procedure, fixing, staining, mounting, the use of the microscope, and so on, are dealt with. There are many useful references to books or papers that advocate special methods.

The volume is intended for "Hochschulen" and universities, but there are one or two points in which its usefulness might have been increased. There are, for example, no instructions as to how to collect and observe animals. A few remarks on nets and boxes do not constitute instruction, and general directions would be a most useful addition, if they were devoted to skinning and preserving; how to work different kinds of ground, sea, lake, moor, &c.; how to obtain material for observing life-histories. Another point omitted is the insertion of directions for collecting in other countries, especially in the tropics, where difficulties of unusual order have to be overcome. Again, the author does not appear to describe how any of the apparatus may be made. It is, of course, nearly always possible to buy what you require ready-made, but there are many advantages in knowing how to make the simpler pieces of apparatus, since not only the manipulation is learnt, but the physics of the working are mastered in a way that no ready-made machine permits. For physiological work particularly such training is simply invaluable.

The only other point that has occurred to us is the incomplete nature of the instruction on certain modes of procedure, a drawback common to so many "practical" text-books. Thus in reconstructing embryos or animals from sections, the author does not state exactly what to do or what precautions to take to ensure a satisfactory result. Perhaps, however, the subject will recur in his later volume. In fact, any judgment on this section of the work is premature until the second part has appeared, as we trust it soon will. We must say, however, that only the beginner will learn much from the present instalment. The methods are, so far as we have been able to test them, well known and ably advocated already. But to anyone who is fitting up a laboratory or starting out upon a course of practical study, the work may be heartily recommended.

#### CONSTRUCTION IN EARTHQUAKE COUNTRIES.

*Le Case Nelle Regioni Sismiche e la Scienza delle Costruzioni.* By A. Montel. Pp. iv+116. (Torino: S. Lattes and Co., 1910.)

THIS book, dealing with construction in earthquake-shaken countries, opens with a few words on the nature of earthquake motion, particularly acceleration. Then follows two scales of seismic intensity. After this a little is said about the nature of foundations, as, for example, whether they are upon soft or hard ground, on a slope, or on a plain.

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The materials used for construction are given considerable consideration, particularly the advantages that may be obtained by the use of ferro-concrete. The pictures, like those showing the framework of buildings, and various formulæ are old acquaintances, whilst the text which accompanies them in many places closely follows a translation from English into Italian. Its author, Mr. Montel, particularly refers to two books from which he has obtained his information; one is No. 4 of the publications of the Earthquake Investigation Committee of Japan, written almost entirely by Dr. F. Omori, and the other is "La Science Séismologique," by Comte de Montessus de Ballore. The other contributors to some eighty volumes issued by the Earthquake Investigation Committee have been omitted, and no reference made to the Transactions of the Seismological Society of Japan, in which we find accounts of almost everything that has been elaborated by Dr. Omori, and written about by Count Montessus and Mr. Montel.

Some thirty years ago, when Europeans were invited to Japan, their attention was naturally directed to earthquakes. These they measured, and earthquake motion was for the first time reduced to mechanical units. The result was that engineers and constructors learned for the first time something about the forces with which they had to contend. The visitors even went a little further, and tested their suggested formulæ by placing columns of masonry and other articles on a truck which could be moved back and forth at an increasing rate. The quickness or suddenness of motion required to produce the shattering or overturning of these objects was recorded, and theory brought into closer relationship with practice. For many years past new forms of buildings have been rising in Japan, and these are found to withstand earthquake movement better than their predecessors. The formula of C. D. West, formerly professor of engineering in the University of Tokyo, which is the foundation of all other formulæ, relating to the more important principles guiding constructors occupies a prominent position in Mr. Montel's work, but the name of C. D. West is not mentioned. About this we need not be surprised, because it is only found with difficulty in those works from which he quotes. But practical seismology has grown and it must not be supposed that the guests who visited Japan some thirty years ago did everything. Their work also had foundations.

So far as we know, Robt. Mallet was practically the first man who treated earthquake movement scientifically, and attempted to reduce it to practical units. Notwithstanding his work, engineers continued to regard an earthquake as something strong, and to resist its effects structures should be strong and heavy. Although M. Montel has not done all the justice he might have done by more extensive references, still he has produced a useful book, and if the principles it sets forth are adopted in the earthquake-shaken parts of Italy, they should do much to ameliorate the lot of inhabitants of those regions.

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